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ABSTRACT

A detailed description is provided of the variable allocated learning time (ALT), which is part of the analysis in phase I of the Evaluation of Practices in Individualized Schooling. The variable is defined; the questionnaires on which the variable is based are listed, the procedures used to scale the variable are explained; the distribution of the variable in the 156 individually guided education (IGE) schools which participated in phase I is described; and the internal consistency of the variable is reported. (Author/MH)

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PROCEDURES USED IN PHASE I OF THE IGE EVALUATION TO SCALE THE VARIABLE ALLOCATED LEARNING TIME

by Gary G. Price, Terence C. Janicki, Judith A. Howard, Deborah M. Stewart, Anne E. Buchanan, and Thomas A. Romberg

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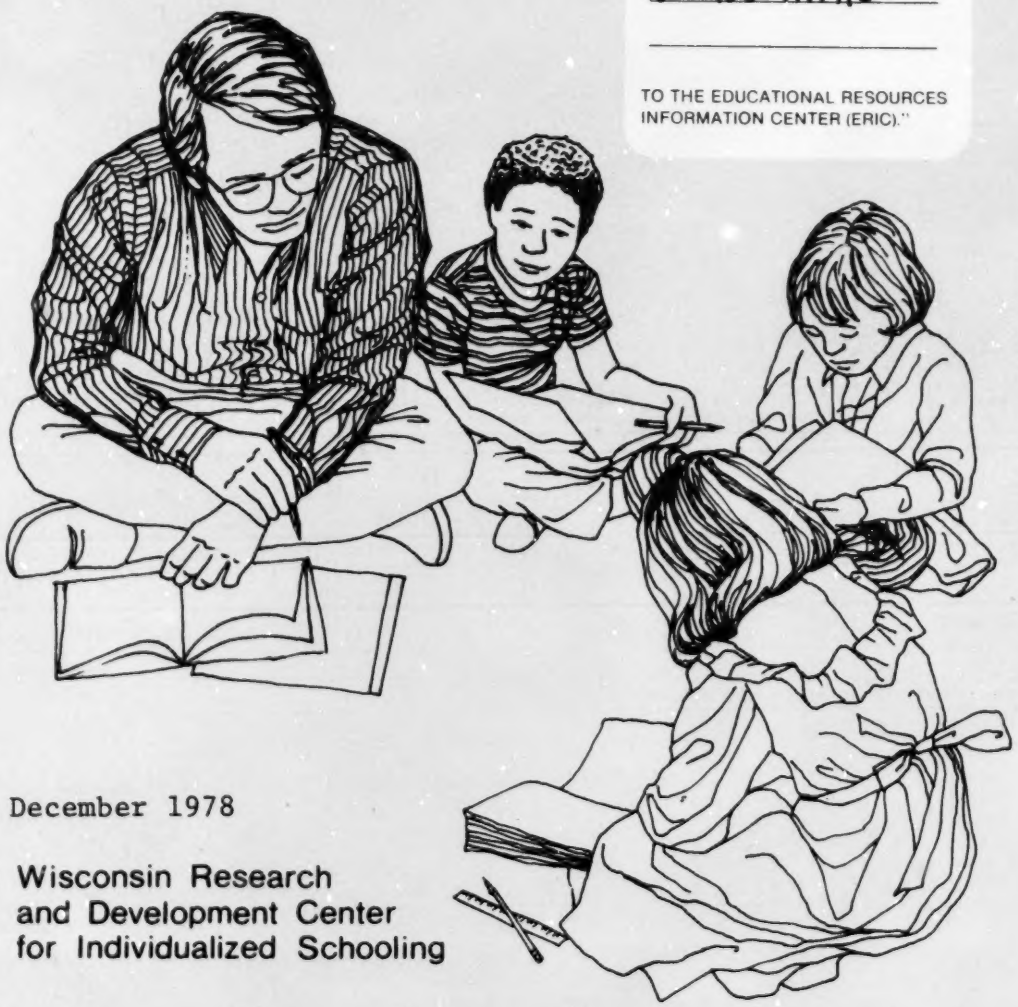

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Report from the Project on
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for Individualized Schooling
The University of Wisconsin
Madison, Wisconsin

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Abstract

This report provides a specific discussion of a variable that is part of the analysis in Phase I of the Evaluation of Practices in Individualized Schooling. The name of the variable is Allocated Learning Time (ALT). Included in this discussion is a verbal definition of the variable, a list of the questionnaire items on which the variable is based, a technical explanation of the procedures used to scale the variable, a description of the distribution of the variable in the 156 schools that participated in the Phase I study, and the internal consistency of the variable. Most readers would find it useful to read Technical Report No. 475, Overview of School and Unit Variables and their Structural Relations in Phase I of the IGE Evaluation, before beginning this one.

Procedures Used in Phase I of the IGE Evaluation to Scale the Variable Allocated Learning Time

This Technical Report provides a detailed description of the variable, Allocated Learning Time (ALT). The description includes a verbal definition of the variable, a list of the questionnaire items on which the variable was based, and a technical explanation of the procedures used to scale the variable. The report also contains a description of the distribution and the internal consistency of the variable. This variable, among others, is part of the analysis in Phase I of the Evaluation of Practices in Individualized Schooling. Phase I, which is a study of 156 Individually Guided Education (IGE) schools, is the large sample part of the overall evaluation effort. Further explanation of the Phase I study and an explanation of the relationship of this variable to the Phase I analysis is given in Technical Report No. 475, Overview of School and Unit Variables and their Structural Relations in Phase I of the IGE Evaluation.

Verbal Definition of the Variable

Allocated Learning Time (ALT) is a measure of the instructional time that I&R unit teachers report as being devoted to learning activities concerned with specific subject areas.

Explanation of Variable-naming Conventions

This measure, like most of the variables used in Phase I of the IGE evaluation, is a composite of items taken from several different instruments. The names and identification numbers of the respective instruments are given in Table 1, along with other information. The instruments numbered 11, 17, 51, 52, and 53 were given to all staff members[1] of each school studied, and were to be filled out individually. One copy of Instruments 22, 25, and 26 was given to each of the I&R units[2] studied (two I&R units from each school, one that included second grade students and one that included fifth grade students). These instruments were filled out by the unit as a group, after they reached consensus. Instruments 23 and 24 were given to teachers of the I&R units studied and they filled them out individually. One copy of Instruments 16 and 21 was given to the IIC of each school, and was filled out by the IIC as a group. Instrument 13, a questionnaire about the entire school, was filled out by the principal of the school.

In order to keep track of information collected from different sources, it was necessary to develop some complex conventions for naming variables. Those conventions are explained here. The abbreviated name of each item and each variable contains eight or fewer

---

[1] Includes all professional personnel (i.e., not aides) assigned at least one-third time to the building in both the 1976-7 and 1977-8 school years.

[2] Includes all professional personnel (i.e., not aides) assigned at least one-third time to the I&R unit in both the 1976-7 and 1977-8 school years and directly involved in planning instruction for the unit students in reading, math, or language arts.

Table 1

Instrument Identification

Test booklet	Instrument	Instrument number	File	Respondent
General staff questionnaire	IGE implementation survey	11	H	School staff members
	Staff background	17	H	School staff members
	Assumptions regarding conditions of schooling	51	H	School staff members
	Job satisfaction survey	52	H	School staff members
	Assumptions regarding learning and knowledge	53	H	School staff members
Unit staff questionnaire	I&R structure and function	22	A,B	Unit as a group
	Record keeping and regrouping	25	A,B	Unit as a group
	Instructional time and objectives	26	A,B	Unit as a group
	Role of staff teacher	23	F,G	All unit teachers
	Instructional practices	24	F,G	All unit teachers
IIC questionnaire	IIC structure and function	21	C	IIC as a group
	Demographic background	16	C	IIC as a group
IGE schools questionnaire	IGE schools questionnaire	13	C	Principal

characters, in order to be readable by computer. The first character of each item and variable name is a letter that indicates the case for whom the item or variable is a measure. In this discussion, variables include information from two or more questionnaire items or transformed information from one item. Items coming from a common source (i.e., the same respondents) were collected into a common data file whose name corresponds to the first letter in the names of all items collected in it. There were six such files. Those files, described in terms of the cases to which they pertain and in terms of their respective alphabetic codes, are:

A I&R units containing 2nd grade students (the I&R unit as a case).

B I&R units containing 5th grade students (the I&R unit as a case).

C The entire school as a case.

F Individual teachers of I&R units containing 2nd grade students.

G Individual teachers of I&R units containing 5th grade students.

H Individual staff members employed by the school.

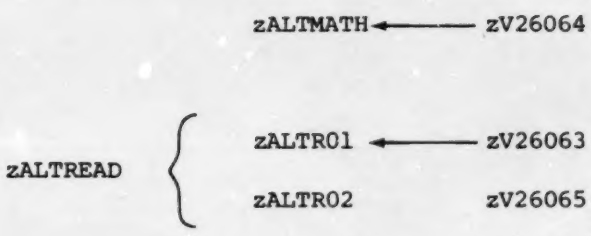
Item names. The second character in all item names is the letter "V," which distinguishes item names from names of other variables. The third and fourth characters in item names denote the number of the instrument of which the item is a part (see Table 1). The fifth, sixth, and seventh, and in some cases, eighth characters in item names contain the identification number of the item within the instrument. For example, Item number 1 from the Staff Background Questionnaire (Instrument 17), which was given to all members of the school staff, is named as follows:

HV17001
- Item number
- Instrument number
- Identifies this as an item
- File H (includes responses of individual staff members)

Variable names. Variable names, like item names, begin with an alphabetic code that indicates the cases to which they pertain. Following that first character is an abbreviation of two to four characters used by the evaluation staff to denote the major composite of which the variable is a constituent. Subsequent characters identify the position of the variable in the scaling operation, as diagrammed in Figure 1. For example, one of the constituents of the Intraorganizational Structure composite (IOS) is named as follows:

CIOSA02
- Second indicator of Part A (whether principal is full time)
- Part A of IOS (personnel allocation and composition of I&R units)
- Composite name (Intraorganizational Structure)
- File C (includes measures of the school as a whole)

Some of the composites are measures of the school as a whole, whereas others are specific to both the I&R unit (2nd or 5th grade) and the subject area (math or reading). Composites that pertain to the school as a whole are: Interorganizational Relations (IOR), Procedures Fostering Coordination and Improvement of the School Program (GOSB), General Staff Background (GSB), Intraorganizational Structure (IOS), Belief in Individual Differences (INDIV), View of Learning: Constructivism vs. Behaviorism (CVSB), the School's Demographic Setting (DB), General Implementation of the Instructional Programming Model (GOSA), and Teacher Job Satisfaction (JOBSAT).



IF GRADE EQUALS TWO: zALTREAD = (.667 * zALTR01 + .333 * zALTR02)

IF GRADE EQUALS FIVE: zALTREAD = (.5 * zALTR01 + .5 = zALTR02)

$$z = \{A,B\}$$

Figure 1: Allocated Learning Time.

Composites that are specific to I&R unit and subject area are: Utilization of Curriculum Resources (UCR), Information Acquisition (IA), Individualization of Instructional Decisions (IDM), Management of Grouping and of Instructional Continuity (IE), Allocated Learning Time (ALT), and measures of student achievement. In the technical explanations of scaling, composites specific to the 2nd grade I&R unit begin with the letter "A"; composites specific to the 5th grade I&R unit begin with the letter "B." For brevity, a lower case "z" is used as the first letter wherever the explanation of scaling applies to both the 2nd and 5th grade I&R units.

Scaling Procedure

Unfortunately, there is only one item available per subject area to measure this variable. Moreover, not only are the response categories for these three parallel items too large to yield truly discriminatory measures of ALT, but the self-report nature of these items may also invalidate ALT somewhat. Appendix A contains the three items used to measure ALT. Appendix B contains the Statistical Package for the Social Sciences (SPSS) commands used to construct the variable from the data files. Figure 1 (see page 6) shows the scaling operations for ALT. It is a schematic portrayal of the scaling; it does not represent the numerical operations.

Allocated learning time in math (zALTMATH). zALTMATH is composed of responses by the unit as a group to zV26064, an item which assesses how many minutes per day are allocated to unit students for

instruction and relaxed follow-up activities in mathematics. Responses of zero to one-half hour are assigned a value of zero. This reflects the rationale that less than 30 minutes per day is not enough time in which to learn a significant amount. This variable is labelled zALTMATH, with values ranging from zero to four. This operation occurs in both files AUNIT2 and BUNIT5, corresponding to units two and five.

Allocated learning time in reading (zALTREAD). zALTREAD is composed of two segments: zALTR01, responses by the unit as a group to zV26063; and zALTR02, responses by the unit as a group to zV26065. These items assess how many minutes per day are allocated to unit students for instruction in reading and language arts, respectively. The interrelationship of these items is varied by unit level. At unit two, reading time is weighted twice as heavily as language arts. At unit five, where verbal facility is more important, reading and language arts are equally weighted. The combination of zALTR01 and zALTR02 is labelled zALTREAD, with values ranging from zero to four. These operations occur in both files AUNIT2 and BUNIT5, corresponding to units two and five. If a school does not have language arts per se, the score for zALTREAD in both 2nd and 5th units would be equal to zALTR01.

Distribution and Internal Consistencies of the Scaled Composites

The distribution of Allocated Learning Time (ALT) based on the 156 schools of the Phase I sample, described in Table 2, is in terms

Table 2

Distribution of Allocated Learning Time

Composites	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
AALTMATH	1.046	.504	1.016	0	0	4.0	4.0
AALTREAD	1.898	.760	1.667	0	0	4.0	4.0
BALTMATH	1.045	.461	1.011	0	0	4.0	4.0
BALTREAD	1.179	.576	1.108	0	0	4.0	4.0

of the mean, standard deviation, median, actual minimum value obtained, logical minimum value obtainable, actual maximum value obtained, and logical maximum value obtainable. The internal consistencies of the ALT composites and their constituents are presented in Table 3. Figures 2, 3, 4, and 5 are histograms of these composites.

The relation of internal consistency to reliability in general and to validity can be difficult to understand. A composite whose constituents have high internal consistency may or may not possess high test-retest reliability. Conversely, a composite that has high test-retest reliability may have low internal consistency. Any composite that measures a homogeneous construct should rightfully be expected to have high internal consistency, but a composite that measures a construct which combines several facets which are empirically unrelated should not necessarily have high internal consistency, as noted by Cronbach and Meehl (1955)[3]. Several of the composites used in Phase I fit the latter description, and, accordingly, should not be expected to have high internal consistency.

---

[3]Cronbach, L. J., & Meehl, P. E. Construct validity in psychological tests. Psychological Bulletin, 1955, 52, 281-302.

Table 3

Internal Consistency of Allocated Learning Time (ALT)

Composites	α
AALTMATH	--[a]
AALTREAD	.20
BALTMATH	--[a]
BALTREAD	.54

[a]The internal consistency cannot be calculated since this is a one-item composite.

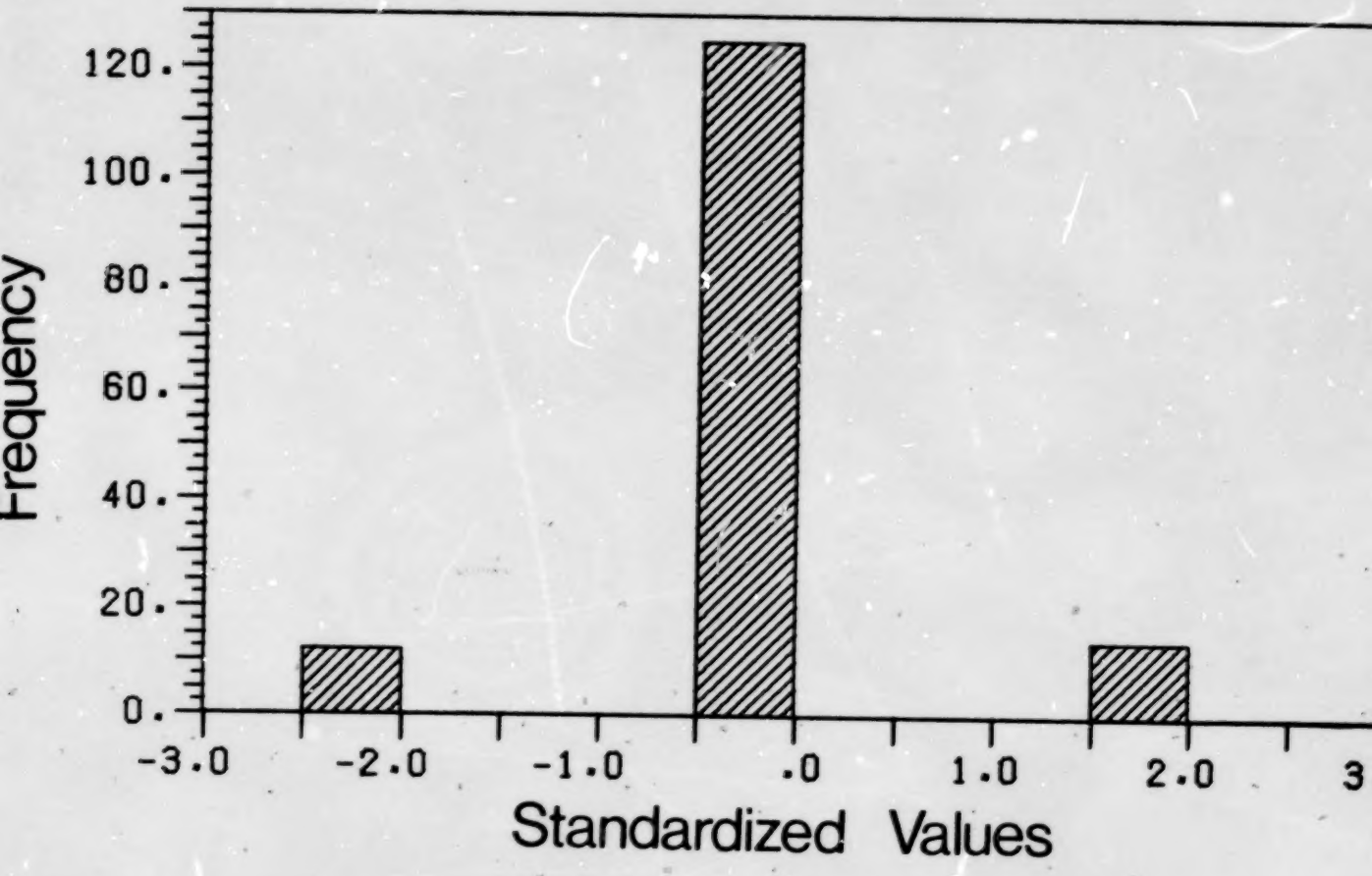


Figure 2. Allocated learning time (second grade mathematics).

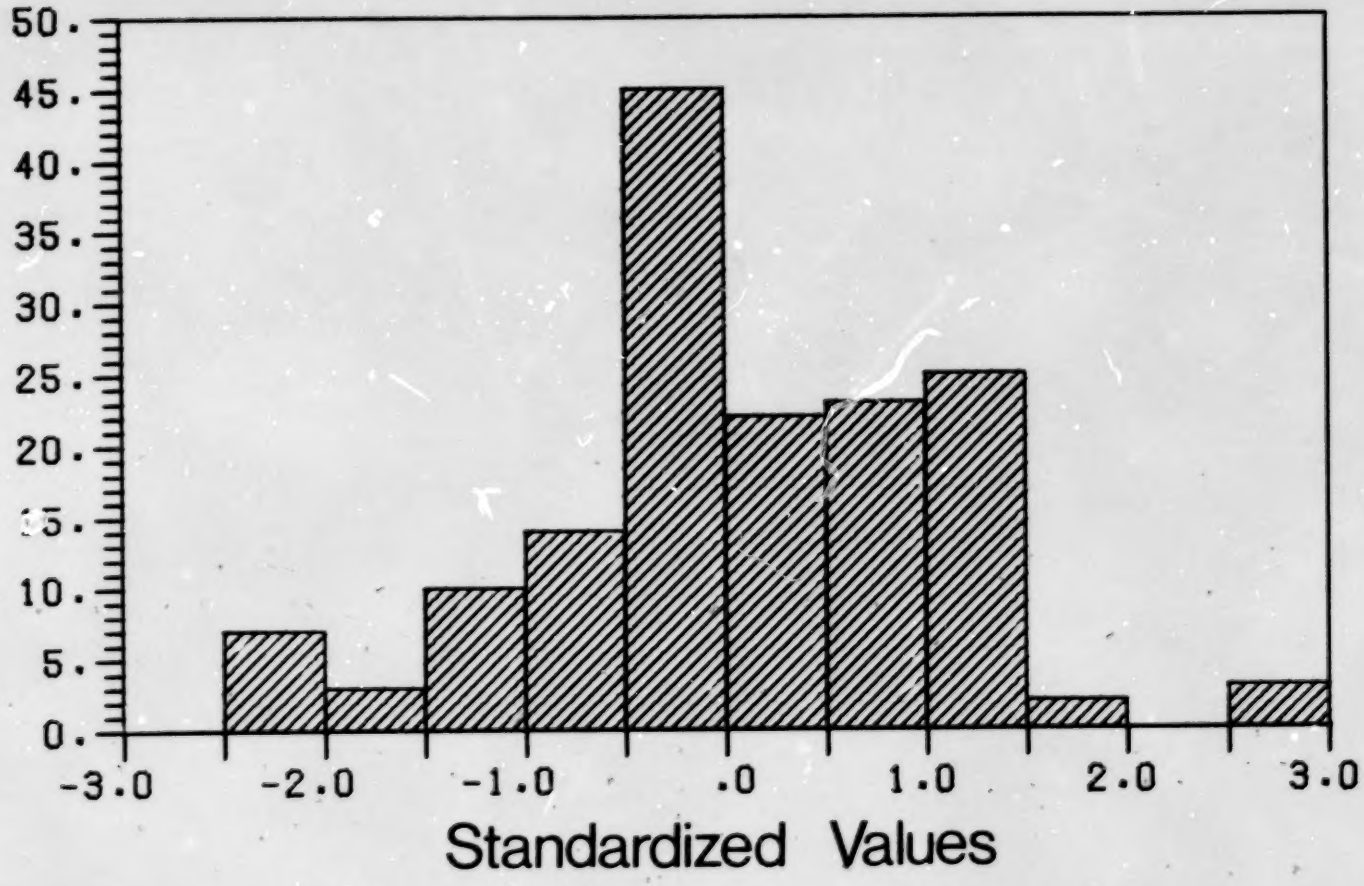
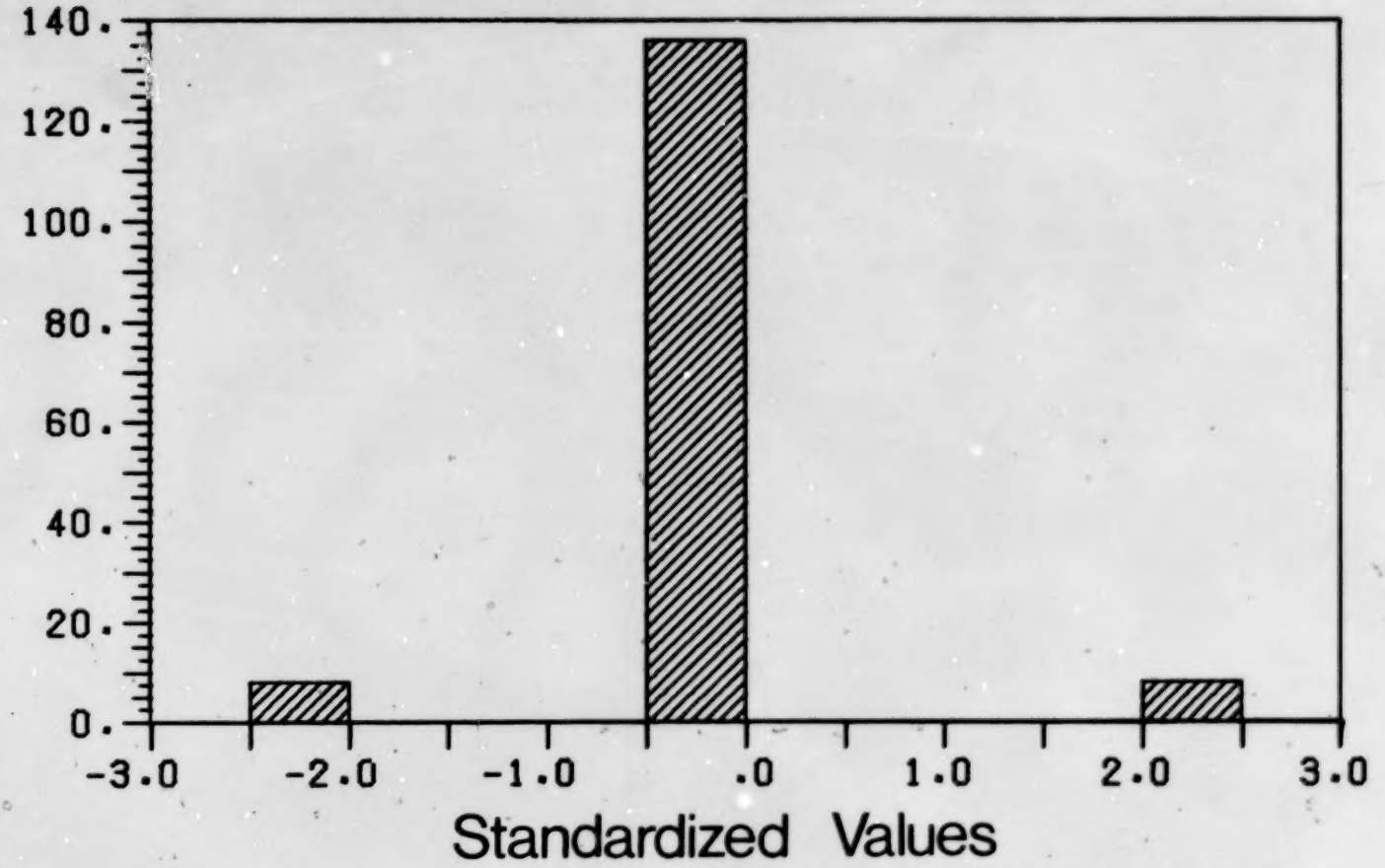


Figure 3. Allocated learning time (second grade reading).



igure 4. Allocated learning time (fifth grade mathematics).

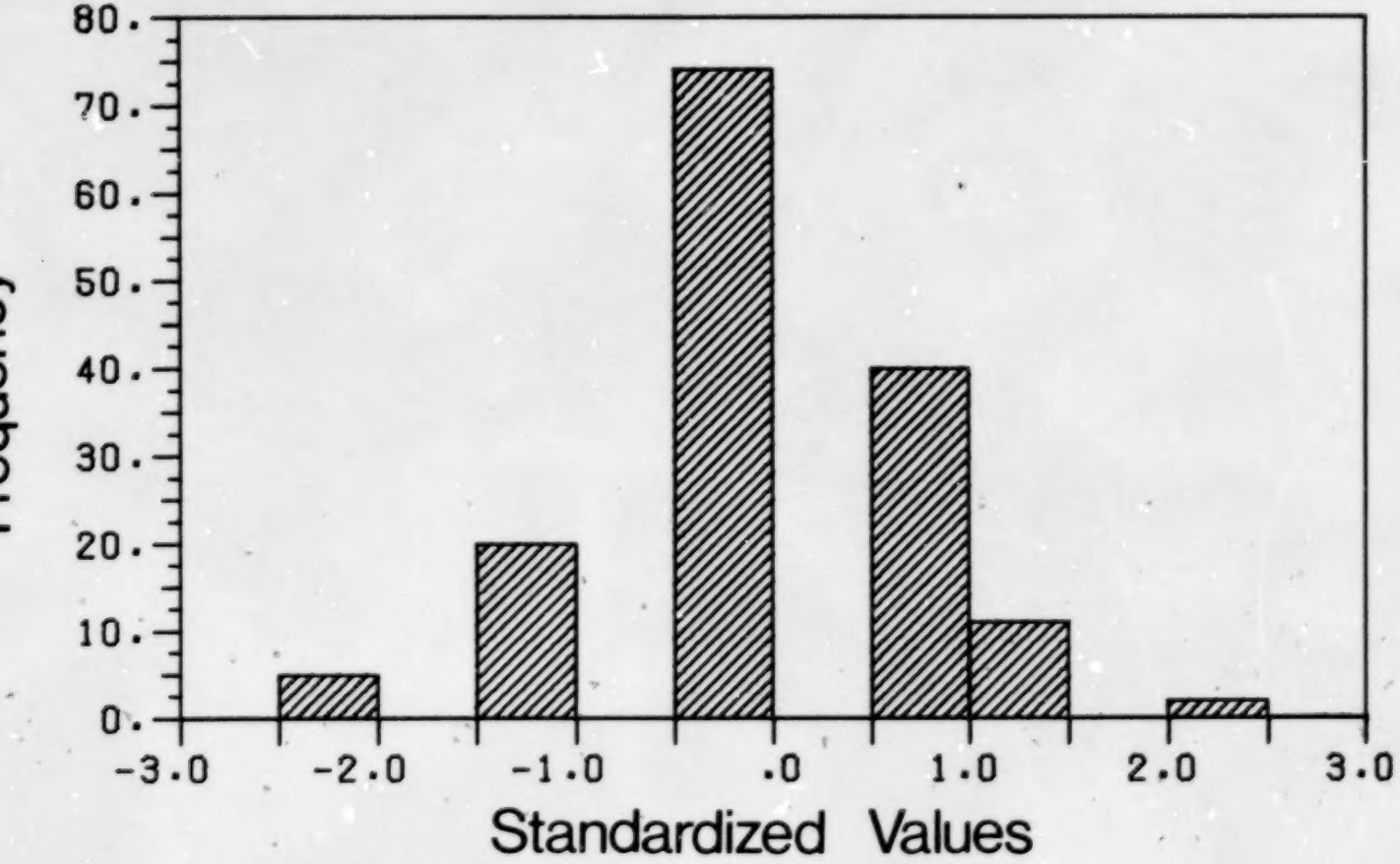


Figure 5. Allocated learning time (fifth grade reading).

Appendix A: Item Pool Selected

Files A,B: Unit as Case

zV26063

zV26064

zV26065

TIME ALLOCATION

How many minutes per *day* on the average does your unit allocate to Grade 5 students for instruction and related follow-up activities (e.g., worksheet completion, independent activities) in these curriculum areas?

zV26063	63	Reading	(0) 0-30 minutes (1) 31-60 minutes (2) 61-90 minutes (3) 91-120 minutes (4) more than 120 minutes
zV26064	64	Mathematics	Choose (0), (1), (2), (3), or (4) as above
zV26065	65	Language arts	Choose (0), (1), (2), (3), or (4) as above

Appendix B: SPSS Commands for ALT

ALTMATH

Operations to do in AUNIT2 and BUNIT5
(Letting z=A in AUNIT2 and z=B in BUNIT5)

```
COMPUTE          AALTMATH = AV26064
VAR LABELS       AALTMATH, ALLOCATED LEARNING TIME MATH/
ASSIGN MISSING   AALTMATH (-99)
```

ALTREAD

Operations to do in AUNIT2

```
COMPUTE          AALTR01 = AV26063
COMPUTE          AALTR02 = AV26065
ASSIGN MISSING   AALTR01, AALTR02 (-99)
COMPUTE          AALTREAD = AALTR01
IF               ((AGRADE EQ 2) AND (-99 NE AALTR01 AND AALTR02))
                 AALTREAD = (.6667 * AALTR01) + (.3333 * AALTR02)
IF               ((AGRADE EQ 5) AND (-99 NE AALTR01 AND AALTR02))
                 AALTREAD = (.5000 * AALTR01 + (.5000 * AALTR02)
VAR LABELS       AALTREAD, ALLOCATED LEARNING TIME READING/
VALUE LABELS     AALTMATH TO AALTREAD
                 (0) 0 TO 30 MINUTES
                 (1) 31 TO 60 MINUTES
                 (2) 61 TO 90 MINUTES
                 (3) 91 TO 120 MINUTES
                 (4) MORE THAN 120 MINUTES
PRINT FORMATS    AALTREAD (3)
MISSING VALUES   AALTREAD (-99)
```

A parallel version of the above computation occurs in BUNIT5 creating BALTREAD, which is the 5th grade version of allotted learning time in reading.

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